Please read Sections 5.5 through 5.8, Section 5.10, and Sections 6.1 through 6.5 of the textbook and then answer the following, trying not to look at your notes or at the textbook. Quiz #7, on Fri. 21 Oct., will consist exclusively of questions taken from the Part 1 of this homework.

Ex. 1. What would be printed?

```
for (int num = 3 ; num <= 5 ; num++)
System.out.print(num + " ");
```

Ex. 2. Write a for loop that prints "1, 2, 3, 4, 5, 6, 7, 8, 9, 10, ".

Ex. 3. Write a for loop that prints "1 3 5 7 9 ".

Ex. 4. What do we name a variable that is incremented at every iteration of a loop, i.e., that keeps the running total?

Ex. 5. What is a sentinel value?

Ex. 6. Consider the following code:

```
for (int y = 0 ; y <= 3 ; y ++)
    for (int z = 1 ; z < 5 ; z ++)
        System.out.print("Scene " + y + ", take " + z);
```

How many times does the outer loop iterates (i.e., how many scenes are shot)? How many times does the inner loop iterates (i.e., how many takes for each scene)? Finally, what is the total number of iteration of the nested loops (i.e., how many takes are made)?

Ex. 7. Circle the pretest loops:

```
        do-while        switch        while        for        if-else-if
```

Ex. 8. How many times would "Hi!" be printed?

```
boolean flag = false;
do
{
  System.out.print("Hi!");
}while (flag);
```

Ex. 9. Can the body of a pretest loop be executed 0 times?

Ex. 10. Convert the following `while` loop to a `for` loop.

```
int k = 0;
while(k < 10)
{
  System.out.print(k + "\n");
  k++;
}
```

Ex. 11. Write an example of wildcard `import` statement.

Ex. 12. What is the class used to write data in a file? What is the class used to read data in a file? In which packages are they?

Ex. 13. Give a method header for a `main` method capable of throwing an exception of the `IOException` type.

Ex. 14. What is wrong with the following statement?

```
PrintWriter dataFile = new PrintWriter(myfile.txt);
```

Ex. 15. What is the purpose of the `close` method of the `PrintWriter` class? When should you use it?

Ex. 16. What is the return type of the `hasNext` method of the `Scanner` class? What is it used for?

Ex. 17. Declare a static field of type double named `ratio`.

Ex. 18. What is the signature of a method?

Ex. 19. Can you define the following two methods in the same program?

```
public double cube(int num)
{ return num * num * num; }
public int cube(int num2)
{ return num2 * num2 * num2; }
```

Ex. 20. Fill in the blanks: Java's default constructor sets numeric fields to ...., `boolean` fields to ...., and references variables to ....

Ex. 21. How many default constructor may have a class?

Ex. 22. If you pass an object as an argument to a method, you actually pass ....

Part II — Programming Exercises

Ex. 1. We're going to design a simple game of guessing numbers randomly generated.
For this program, you'll need to import the `Random` and `Scanner` classes. Generate randomly a value between 0 and 299. Then, ask the user to guess the value you generated. If the guess is right, print "You found it!" and exit the program. If the guess was wrong, print "Too high!" or "Too low!" (depending on if the guess was too high or too low) and ask the user for another value. Your program should loop until the user correctly guessed the random number.
Type your program in BlueJ once you're sure it is perfect, correct it if needed, and compile and execute it.
If you want to improve your game, you could do (one of) the following:

- Offer three levels of difficulty.

- Offer to play another time after the value was guessed.

- Print a score (i.e., the number of attempts).

Ex. 2. This exercise requires you to have access to a computer. Create a folder, and create in it a file named `InputData.txt` with some text (for instance, you could copy-and-paste the last email you sent). In the same folder, create a `MyProg.java` file with the following code (available at `https://cs.appstate.edu/~aubertc/1440/hw/MyProg.java`):

```java
import java.io.IOException;
import java.util.Scanner;
import java.io.File;
import java.io.PrintWriter;

public class MyProg{
    public static void main(String[] args) throws IOException{
        File f = new File("InputData.txt");
        Scanner inf = new Scanner(f);
        PrintWriter ouf = new PrintWriter("OutputData.txt");
        while(inf.hasNext()){
            ouf.println(inf.nextLine().toUpperCase());
        }
        inf.close();
        ouf.close();
    }
}
```

Read that program carefully, and describe what it will do. Then, compile it and run it. Does what happened match your prevision?

Edit this program in three different ways to obtain three different programs:

1. A program that converts the content of `InputData.txt` to lower case and copies it to another file.

2. A program that copies every other line of `InputData.txt` into another file.

3. A program that copies the first character of every line of `InputData.txt` into another file.

$\wp$